

iFLEX-iRIS

Fiber coupled laser systems

The Qioptiq iFLEX-iRIS™ solid state laser systems offer high performance stability with low amplitude noise in a miniaturized package. They are ideally suited for integration into instruments that demand high performance yet need to retain a small form factor. The lasers are mode-hop free and wavelength stabilized as a result of active temperature control.

All CW iFLEX-iRIS lasers operate in automatic power control mode using an internal feedback loop. This feature provides highly stable output power, and ensures the high power stability performance is maintained throughout the product lifetime.

Well controlled digital modulation can be offered through the electrical interface PINs. This feature must be selected with order.

Increased freedom of design and ease of servicing is offered with the detachable kineFLEX® single-mode polarization maintaining fiber delivery system. Fiber may be selected with order or fitted by customers as a later upgrade option, to iFLEX-iRIS lasers with a centralised output beam. This detachable fiber delivers true “Plug & Play” design freedom.

To ensure optimum performance is maintained throughout the product lifetime, the iFLEX-iRIS laser design is robustly tested to Telcordia specifications.

Product features include:

- High stability operation
- High beam quality, TEM₀₀
- Low noise
- Miniaturized for easy integration
- Integrated electronics and TEC temperature stabilized control
- Conductively cooled through baseplate
- Automatic Power Control
- Mechanical shutter
- Electronic shuttering
- Fiber delivery system, detachable kineFLEX

Options include:

- Over 100 standard single-mode polarization maintaining fiber delivery options using the detachable kineFLEX
- Digital modulation
- CDRH compliant interlock unit
- Adaptor cable when an iFLEX-iRIS is used as a retrofit replacement for an iFLEX2000™ laser
- Industry compatible footprints and beam exit positions
- OEM laser versions on request
- OEM fiber versions on request
- Free space iFLEX-iRIS lasers with no fiber output - please see iFLEX-iRIS laser datasheet



iFLEX-iRIS fiber coupled laser specification overview

Operating Wavelengths

Wavelength (nm)	375	405	445	458	473	488	515	520	633	637	642	660	670	730	780	830	852
Laser Power after fiber (mW)	25 30	30 50 100 130 150	20 50	45	50	20 50 90	40	20	20 45	65	20 65	50	6	10	45	65	20

Technical Specifications

Laser parameters		
Center wavelength	± 5*	nm
Power stability (8 hours)	< 2	%
Optical Noise (20Hz-2MHz)	< 0.1**	% rms
Spatial mode	TEM ₀₀	-
Electrical		
Power supply	12V DC, 1A	-
Max. base plate temp.	40	°C
Max. heat dissipation	12	W
Operation Modes		
CW	0.1 - 100% and true off	
Digital Modulation	TTL signal	-
Rise time (10% to 90%)	< 1	µsec
Fall time (90% to 10%)	< 1	µsec
Modulation bandwidth	500	kHz
Laser Dimensions		
Laser only	70(L) x 40(W) x 38(H) mm	
Laser with kineMATIX®	142(L)x ***51(W)x ***51(H) mm	

*Center wavelength exceptions at: 637nm (+6/-5nm), 642nm (+5/-7nm), 660nm (+4/-6nm), 670nm (±10nm), and 730nm (±10nm)

**Model specific please contact Qioptiq for details

***Full extension travel on kineMATIX adjustment screws. Typical setting is 48.5mm(W) x 48.5(H)

Custom OEM versions on request

Fiber parameters		
Fiber length	1, 2 or 3	m
Fiber jacket	Stainless steel, 5mm OD	
Fiber type	Single-mode polarization maintaining (SM PM)	
Polarization ratio	≥ 100:1	-
Collimated fiber output option		
Beam diameter	0.7	mm
M ² (beam quality)	typ 1.1	-
Pointing stability	≤ 1	μrad/°C
Beam divergence	Diffraction Limited	
Mechanical dimensions	Ø12 x 50	mm
Beam position	≤ ± 0.15	mm
Beam angle	≤ ± 0.5	mrad
Connector output options		
Flat polish, polarisation keyed	FCP	
Angle polish at 8 degrees parallel to connector key	FCP8	
Angle polish at 8 degrees perpendicular to connector key	APC	
Environmental conditions		
Storage temp.	10 to 50	°C
Operating pressure	Atmospheric	-
Operating temp.	10 to 40	°C
Operating & storage humidity	Non-condensing, dew point <23°C	

iFLEX-iRIS fiber coupled laser specification overview

Operating Wavelengths: 532nm & 561nm

Wavelength (nm)	532	561
Laser Power after fiber (mW)	25	30

Technical Specifications

Laser parameters		
Center wavelength	± 2	nm
Power stability (8 hours)	< 2	%
Optical Noise (20Hz-20MHz)	< 0.3*	% rms
Spatial mode	TEM ₀₀	-
Electrical		
Power supply	12V DC, 1A (laser)	-
Max. base plate temp.	40	°C
Max. heat dissipation	12	W
Operation Modes		
CW	50 - 100% adjustment and true off	
Laser Dimensions		
Laser only	70(L) x 40(W) x 38(H)	mm
Laser with kineMATIX®	142(L) x 51**(W) x 51**(H)	mm

*Model specific please contact Qioptiq for details

**Full extension travel on kineMATIX adjustment screws.
Typical setting is 48.5mm(W) x 48.5(H)

Custom OEM versions on request

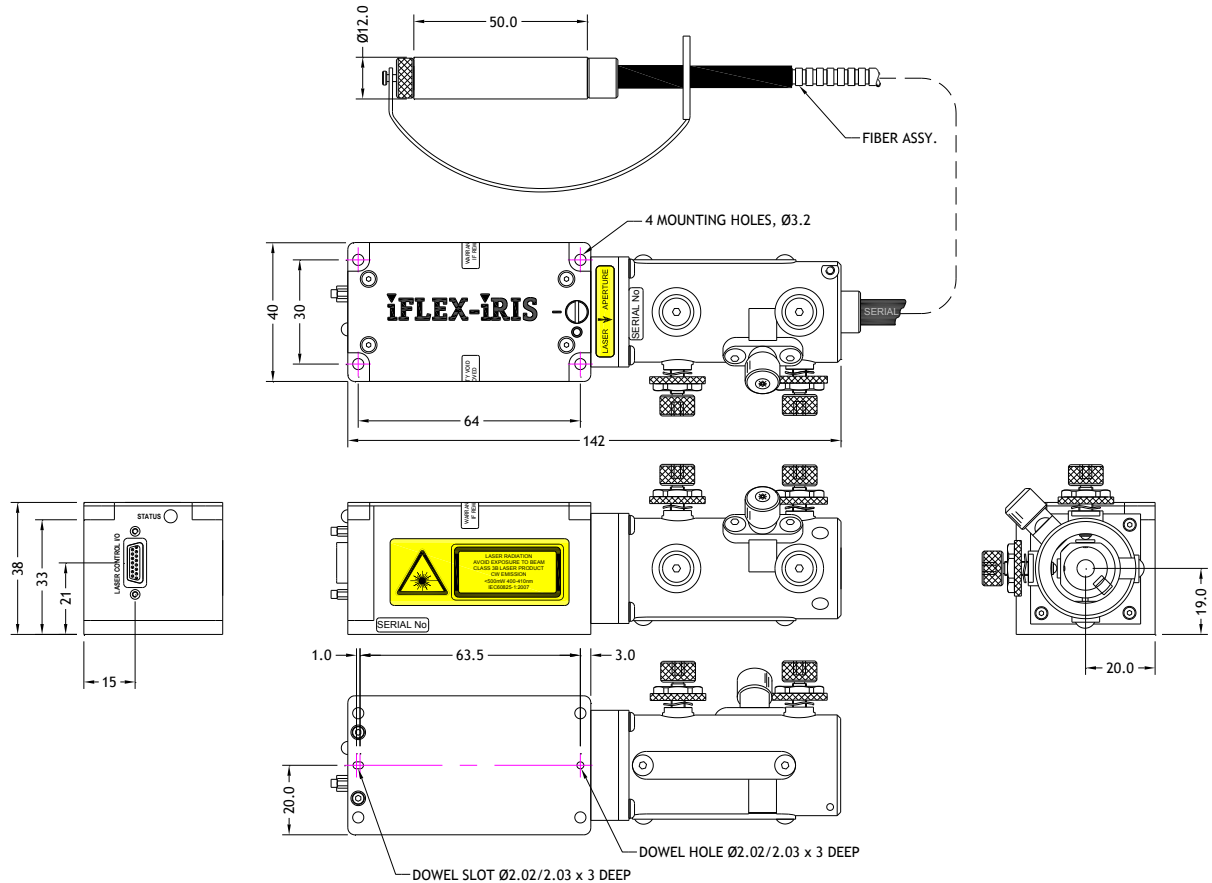
Fiber parameters		
Fiber length	1, 2 or 3	m
Fiber jacket	Stainless steel, 5mm OD	
Fiber type	Single-mode polarization maintaining	
Polarization ratio	> 100:1	-
Collimated fiber output option		
Beam diameter	0.7	mm
M squared	typ 1.1	-
Pointing stability	≤ 1	μrad/°C
Beam divergence	Diffraction Limited	
Mechanical dimensions	Ø12 x 50	mm
Beam position	≤ ± 0.15	mm
Beam angle	≤ ± 0.5	mrad
Connector output options		
Flat polish, polarisation keyed	FCP	
Angle polish at 8 degrees parallel to connector key	FCP8	
Angle polish at 8 degrees perpendicular to connector key	APC	
Environmental conditions		
Storage temp.	10 to 50	°C
Operating pressure	Atmospheric	-
Operating temp.	10 to 40	°C
Operating & storage humidity	Non-condensing, dew point <23°C	

Model: iFLEX-iRIS-P

iFLEX-iRIS-P laser with fiber coupled output

This iFLEX-iRIS laser system includes the detachable kineFLEX single-mode polarization maintaining fiber delivery system.

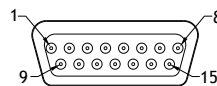
Please refer to the kineFLEX datasheet for full details of all standard fiber options. Please contact Qioptiq Sales to discuss any customized fiber outputs or beam shaping requirements.



iFLEX-iRIS electrical interface

Pin Function

Pin	Function
1	Monitor Photodiode Output (Vmon)
2	Operating Current Output (Vop)
3	External Power Control
4	Laser Enable
5	Temperature OK Signal
6	Reserved
7	Laser Supply Voltage
8	Reserved
9	Reserved
10	Reserved
11	Chassis Ground
12	Digital Modulation Input
13	Reserved
14	0V Laser Supply
15	0V Signal Return

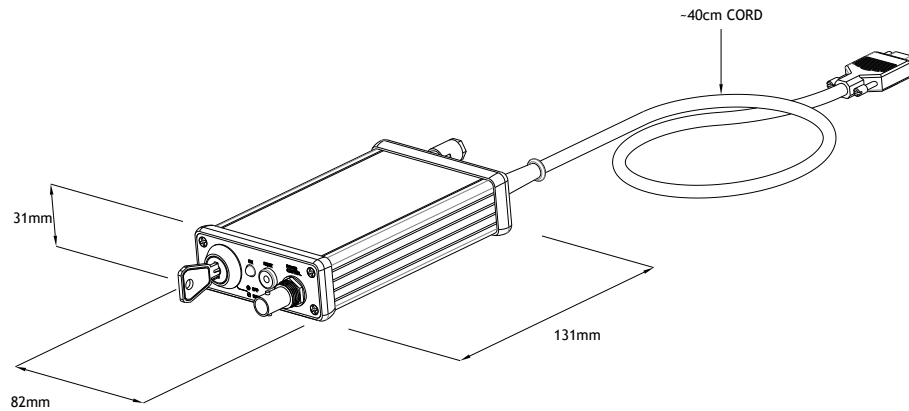


Please refer to iFLEX-iRIS user manual for detailed instructions on electrical control via PINs.

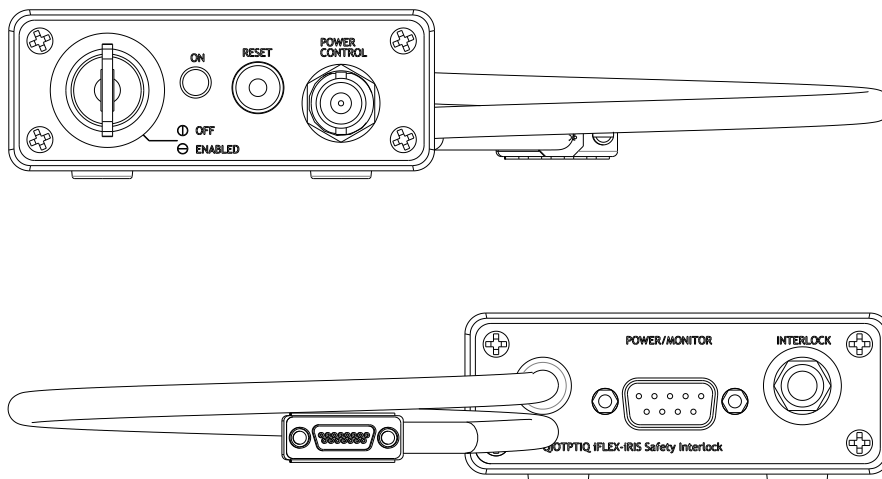
iFLEX-iRIS CDRH compliant interlock unit

For CDRH compliance a bench top standalone laser system must be used with a CDRH compliant interlock remote unit power supply. Qioptiq is pleased to offer this iFLEX-iRIS CDRH compliant interlock remote unit for use with the iFLEX-iRIS laser systems.

Note: The iFLEX-iRIS CDRH compliant interlock remote unit includes keyswitch, keys, interlock plug and power supply. This CDRH compliant interlock unit is recommended for bench top use.

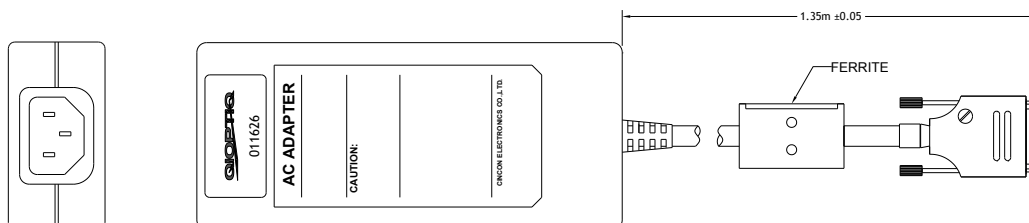


End panel views of the iFLEX-iRIS™ interlock remote unit detailing the location of the different connectors and indicators



iFLEX-iRIS OEM power supply

When iFLEX-iRIS lasers are integrated into OEM instrumentation then power may be supplied directly from the instrument or from an OEM power supply. Qioptiq is pleased to supply this OEM power supply for the iFLEX-iRIS and iFLEX2000 laser systems.

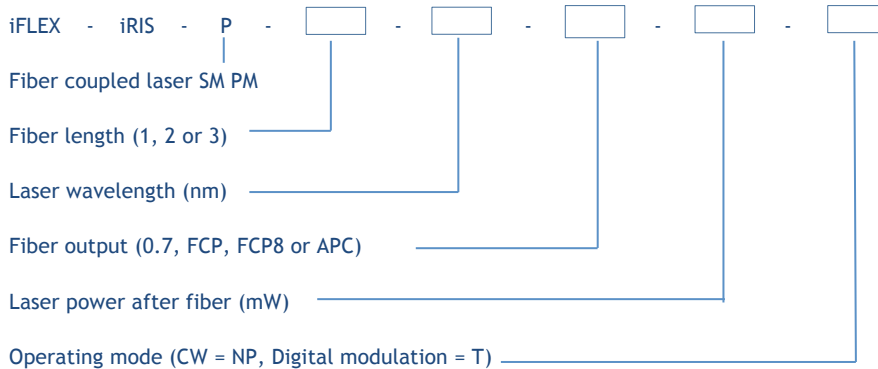


iFLEX-iRIS Adaptor Cable

This allows an iFLEX-iRIS to be installed in place of an iFLEX2000, as a retrofit laser system.

iFLEX-iRIS-P Order Codes

Model: iFLEX-iRIS-P iFLEX-iRIS laser with single-mode polarization maintaining (SM PM) kineFLEX fiber output



For example:

Part description: iFLEX-iRIS-P-2-640-FCP-20-NP

This iFLEX-iRIS laser operates at 640nm and outputs 20mW power measured after the 2m length of kineFLEX single-mode polarization maintaining fiber that is terminated with a FCP connector output. This is a CW laser with output power adjustment. This does not include a power supply.

Please remember to select the appropriate power supply for your requirements

iFLEX-iRIS Power Supply Order Codes

Model: iFLEX-iRIS-CDRH-PSU-SET iFLEX-iRIS CDRH interlock remote unit with power supply, keys and interlock plug

Model: iFLEX-iRIS-OEM-PSU iFLEX-iRIS OEM power supply

Model: iFLEX-iRIS-ADAPTOR-2000 Adaptor cable from iFLEX-iRIS laser to iFLEX-2000 power supply

Note: IEC power lead to wall socket is country specific and may be sourced locally through most electronic retailers. It is not included.

These specifications may be amended without notice under our program of continual improvement, and Qioptiq reserve the right to amend these specifications without notice.

These lasers are designed and manufactured in a factory with ISO9001:2008 certification. These lasers are CE certified. These lasers meet the requirements for IEC60825-1. Only lasers used with a CDRH compliant interlock unit meet CDRH requirements. The addition of a fiber optic output can increase laser hazard. Please follow recommended laser safety guidelines when using these lasers.



Fiber Options for iFLEX-iRIS™ lasers



kineFLEX® fiber delivery systems

Robust, single-mode, polarization maintaining fiber optic delivery system for precision measurement applications. Includes kineMATIX mount and integrated optics

- Fiber options for all iFLEX-iRIS lasers
- Various lengths
- Output options: collimated at 0.7mm diameter or connector FCP, FCP8 or APC
- Fibers also available for other lasers



kineMATIX® manipulator mount

4-axis kinematic mount for coupling free space laser beams into fiber.

- Part of kineFLEX fiber system
- Easy to use
- “Plug & Play” detachable fiber system



Custom fibers designs offered

For different lengths, beam shaping and different opto-mechanics designs. Please contact us to discuss

- Custom miniaturized fibers under Qioptiq's **picoFLEX®** service
- Integrated beam shaping



kineFLEX-DUO™ : OEM only

Robust fused-fiber delivery system for two lasers sources, at visible wavelengths.

- Efficient and simple beam combination
- Single-mode design
- Rugged platform

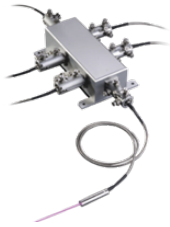


kineFLEX-Hydra™ : OEM only

Fiber designs for parallel laser beams

- Collection fibers using multi-mode designs
- Delivery fibers providing parallel output beams, with integrated beam shaping

Laser combination systems



iFLEX-Adder™
**5 into 1 fiber-coupled beam
 combination system - “add lasers
 together”**

Combine existing and new iFLEX-iRIS
 or other lasers into one co-linear
 output

- Combines up to 5 lines in 1 system
- Combined & co-linear output beam via single-mode, linearly polarized kineFLEX fiber optic output (<-17dB)
- Lasers are included in the iFLEX-Adder
- kineFLEX input fibers attach each laser to iFLEX-Adder system



iFLEX-Gemini™
Dual wavelength laser system
**Optional single-mode, polarization
 maintaining fiber coupled output**

- Combines 2 lines in 1 system
- Independent laser control
- Direct laser modulation
- Combined & co-linear output beam



iFLEX-Viper™
**The world's first integrated multi-
 laser engine**

- Combines up to 5 lines in 1 system
- Combined & co-linear output beam via single-mode, linearly polarized kineFLEX fiber optic output (<-20dB)
- Independent laser control
- Modulation to 1MHz per line
- Easy to upgrade from 3 to 5 lines

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www.qioptiq.com/diode-lasers

www.qioptiq.com/fiber-optics

iFLEX-iRIS™, kineFLEX®, kineMATIX®, kineFLEX-DUO™, kineFLEX-Hydra™, iFLEX-Adder™, iFLEX-Gemini™, iFLEX-Viper™ are trademarks of Qioptiq Photonics Ltd.
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